

What is claimed is:

1. An electric motor comprising:

a housing having an inner circumferential surface, the housing also  
5 having a first predetermined thermal expansion coefficient, the housing further  
having an elastic part; and

a circular stator core pressed to an inside of the housing by tight fit, the  
stator core having an outer circumferential surface, the stator core also having a  
second predetermined thermal expansion coefficient that is different from the first  
10 predetermined thermal expansion coefficient;

wherein a void is defined between the inner circumferential surface and  
the outer circumferential surface so as to prevent the inner and the outer  
circumferential surfaces from contacting each other in a circular region, when the  
housing and the stator core expand or shrink so as to tightly fit each other due to  
15 a differential between the first and the second predetermined thermal expansion  
coefficients, the elastic part which corresponds to the void being elastically  
deformed.

2. The electric motor according to claim 1, wherein the first predetermined  
20 thermal expansion coefficient is larger than the second predetermined thermal  
expansion coefficient.

3. The electric motor according to claim 1, wherein the first predetermined thermal expansion coefficient is smaller than the second predetermined thermal expansion coefficient.
- 5 4. The electric motor according to claim 1, wherein the stator core has a central axis, the number of the voids being plural, a plurality of the voids being provided around the axis.
5. The electric motor according to claim 4, wherein the number of the voids  
10 is three or more than three.
6. The electric motor according to claim 4, wherein the housing and the stator core have a plurality of contacting portions therebetween, the plurality of voids being provided in such a manner that the plurality of contacting portions are  
15 arranged at intervals of an equal angle around the axis.
7. The electric motor according to claim 4, wherein the housing and the stator core have a plurality of contacting portions therebetween, the plurality of voids being provided in such a manner that the plurality of contacting portions are  
20 arranged at intervals of an unequal angle around the axis.
8. The electric motor according to claim 1, wherein the void is provided by

forming a recess in the outer circumferential surface.

9. The electric motor according to claim 8, wherein the stator core has a central axis, the recess having a bottom surface in which a region is located at the opposite sides in a circumferential direction of the stator core, at least the region existing in a first imaginary cylindrical surface, whose center is located on the axis, the inner circumferential surface and the outer circumferential surface being contacted with each other in a contact region, the contact region existing in a second imaginary cylindrical surface, whose center is also located on the axis, radial differential between the first and the second imaginary cylindrical surfaces being predetermined in such a manner that a ratio of the radial differential to the radius of the second imaginary cylindrical surface is approximately 5/1000 to 15/1000.

10. The electric motor according to claim 8, wherein a thinned portion in the shape of a concave surface is formed in the recess.

11. The electric motor according to claim 1, wherein the void is provided by forming a recess in the inner circumferential surface.

12. The electric motor according to claim 11, wherein the recess in the inner circumferential surface is formed by expanding the elastic part outwardly in a

radial direction of the stator core.

13. The electric motor according to claim 12, wherein the stator core has a central axis, the number of spots where the elastic part is expanded outwardly in the radial direction being five or less than five around the axis of the stator core.

14. The electric motor according to claim 11, wherein the recess has a bottom surface in the shape of a concave surface.

15. The electric motor according to claim 1, wherein the stator core has a central axis, the inner circumferential surface and the outer circumferential surface being contacted with each other in a contact region, the contact region existing in an imaginary cylindrical surface, whose center is located on the axis, the contact region having a first predetermined area, the imaginary cylindrical surface having the same length as the stator core in the direction of the axis, the imaginary cylindrical surface also having a non-contact region where the inner circumferential surface and the outer circumferential surface do not contact each other, the non-contact region having a second predetermined area, the void being formed in such a manner that the first predetermined area becomes smaller than the second predetermined area.

16. The electric motor according to claim 15, wherein a ratio of the first

predetermined area to the total area of the first predetermined area and the second predetermined area is 30% or less than 30%.

17. The electric motor according to claim 1, further comprising a coil that is  
5 intensively wound around the stator core.

18. The electric motor according to claim 1, further comprising a coil that is distributively wound around the stator core.

10 19. The electric motor according to claim 1, wherein the housing is made of aluminum and/or aluminum alloy, the stator core being made of silicone steel.

20. The electric motor according to claim 1, wherein a first void element is provided by forming a recess in the outer circumferential surface, a second void  
15 element being provided by forming a recess in the inner circumferential surface, the void including the first void element and the second void element.

21. An electric type compressor comprising:  
a housing having an inner circumferential surface, the housing also  
20 having a first predetermined thermal expansion coefficient, the housing further having an elastic part;  
an electric motor including a circular stator core, the stator core being

pressed to an inside of the housing by tight fit, the stator core having an outer circumferential surface, the stator core also having a second predetermined thermal expansion coefficient that is different from the first predetermined thermal expansion coefficient; and

5           a compression mechanism accommodated in the housing for compressing gas by driving the electric motor;

          wherein a void is defined between the inner circumferential surface and the outer circumferential surface so as to prevent the inner and the outer circumferential surfaces from contacting each other in a circular region, when the  
10   housing and the stator core expand or shrink so as to tightly fit each other due to a differential between the first and the second predetermined thermal expansion coefficients, the elastic part which corresponds to the void being elastically deformed.

15   22.    The electric type compressor according to claim 21, wherein the stator core has a central axis, a first space and a second space being defined at opposite sides of the axis in the housing, the void interconnecting the first space with the second space, the compression mechanism being placed at the first space side, a mouth of the electric type compressor, which is formed through the  
20   housing so as to correspond to the second space, being connected with an external piping, the void being utilized as a gas passage that interconnects the compression mechanism with the mouth.